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ChemRisk/Shonka Research Associates, Inc., Document Request Form

#2799

(This section to be completed by subcontractor requesting document)

J. Lamb / 1034A

Requestor / Document Center (is requested to provide the following document)

Date of request 2/16/96 Expected receipt of document 3/6/96

Document number KP-2048 Date of document 1960(?)

Title and author (if document is unnumbered)

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Date document received

Signature

#2799

KP 2048 1 A

KP-2048

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MEMO AVOID

Date July 27, 19 60

To A. P. Huber

"This document consists of 7 pages.
No. 1 of 1 copies. Series A"

SECRET

Mr. Emlet phoned this date and (in your absence) stated to me that the value of Np-237 recovery, previously considered prohibitive at ORGDP, has increased due to anticipated demand in 1963-64-65. He requested that we take a fresh look at our estimates of source and quantity, recovery costs, and capital [illegible].

A search of your file (3 documents attached) indicates relatively minute quantities anticipated from ORGDP sources, and recovery could be best accomplished via sending cylinders to Paducah for washing, ORGDP solutions to Y-12.

Parson's file (copy of rough draft report attached) indicates Y-12 can more economically process solutions for recovery.

T12308

I could find no file information specifically referring to recovery from barrier materials.

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This Document Contains Restricted Data As Defined In The Atomic Energy Act of 1954. Its Transmittal Or The Disclosure Of Its Contents In Any Manner To An Unauthorized Person Is Prohibited.

UCN-486
(1235 3-59)

FROM

Signed

This document has been approved for release to the public by: [signature] Date 8/16/96
Technical Information Officer, Oak Ridge K-25 Site

Classification changed to: (level and category)

ADC or ADD signature (first reviewer) Date 10/3/94

ADD signature (final reviewer) Date

MEMO AVOID ORAL INSTRUCTIONS Date 19

To

Obviously, Process Engineering has been handling this project, so I presume you will wish them to "re-evaluate." I have alerted John Arendt for a re-evaluation of source inventories. I have not taken any further action since Parsons and Stief are both absent.

Signed H. G. P. Snyder

UCN-486
(1235 3-59)

Return to J A Parsons

NEPTUNIUM RECOVERY FROM SRO-UNH

In the event that the Savannah River enriched fuel recovery flow sheet was altered to eliminate the recovery of neptunium, it would be necessary to recover this element in conjunction with the current recovery of uranium at Y-12 or possibly at ORGDP. At present, the Savannah River UNH contains no neptunium and the uranium is being recovered at Y-12 and converted to UF_4.

Preliminary investigations have been completed regarding the feasibility of recovering neptunium at the K-1420 Recovery Facility or Y-12.

Recovery Method

The most suitable recovery method appears to be the one which is currently used at Paducah for the recovery of neptunium from UF_6 cylinder washings. Block diagrams are attached indicating probable systems for ORGDP and Y-12. Both facilities involve the extraction of uranium and neptunium from the UNH feed solution using 15-20% TBP. Uranium and neptunium are then selectively back-extracted from the organic, in separate columns, by aqueous solutions. The neptunium solution is concentrated by evaporation and then processed through an ion exchange column for final purification.

Depending on the plant site, the uranium is processed to UF_4 or UF_6. At ORGDP, the UF_6 would be fed to the cascade. UF_4 at Y-12 would be re-enriched by blending with product assay UF_4 and then reduced to uranium metal. An alternate method at ORGDP was considered but does not seem too attractive because of increased health physics problems. This method consists of converting the UNH solution to uranium oxide and then to UF_6. The neptunium separation is obtained when the UF_6 is fed to the cascade. Approximately 70% of the total neptunium remains in the UF_6 cylinder heel. Cylinder washings would then be processed through the extraction and ion exchange system to recover the neptunium.

Available Facilities

Y-12

It is likely that little, if any, new equipment would be required at Y-12 to recover neptunium from this source. Extraction capacity is certainly available and it is quite probable that ion exchange columns are available. An estimate of $7,000 to $10,000 for minor piping changes is probably a conservative figure for capital costs.

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ORGDP

Equipment requirements at ORGDP would be considerably greater for processing this material than at Y-12. Uranium processing facilities are adequate; however, additional extraction capacity and ion exchange columns would be needed. An estimate of the required additional equipment and associated capital costs are listed below:

No.	Item	Estimated Cost
2	Ion exchange columns	$ 600
8	Metering Pumps	2,000
4	Storage columns	1,500
2	Install extraction columns	4,000
15	Centrifugal Pumps	3,000
	Piping and Valves	20,000
		$31,100
	Contingency - 15%	5,000
		$36,100
	Engineering Services - 10%	3,600
		$39,700

ALA
5-5-60

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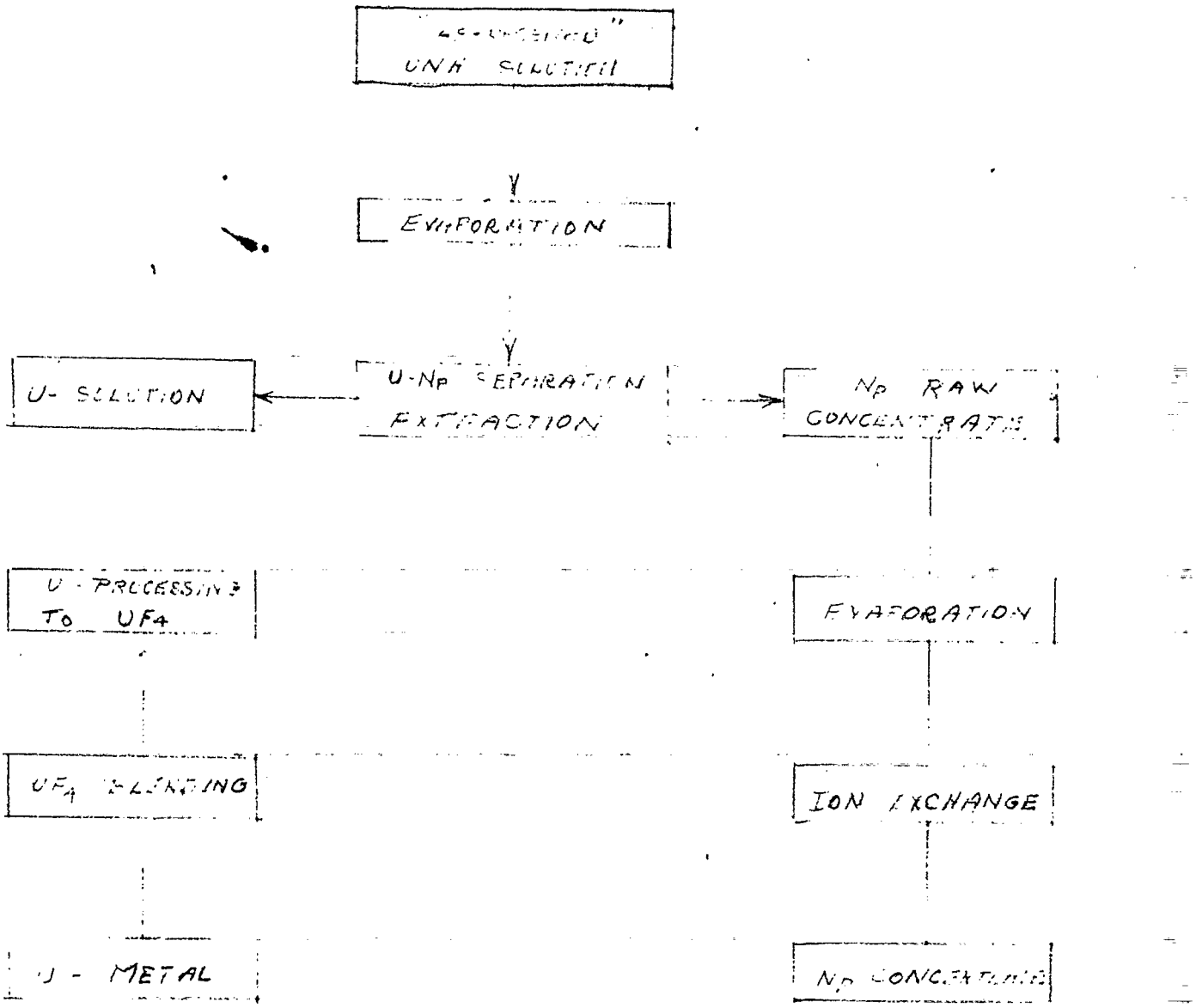
DETAILED X-N METHOD FOR RECOVERY OF Np

FROM SAC-UNH



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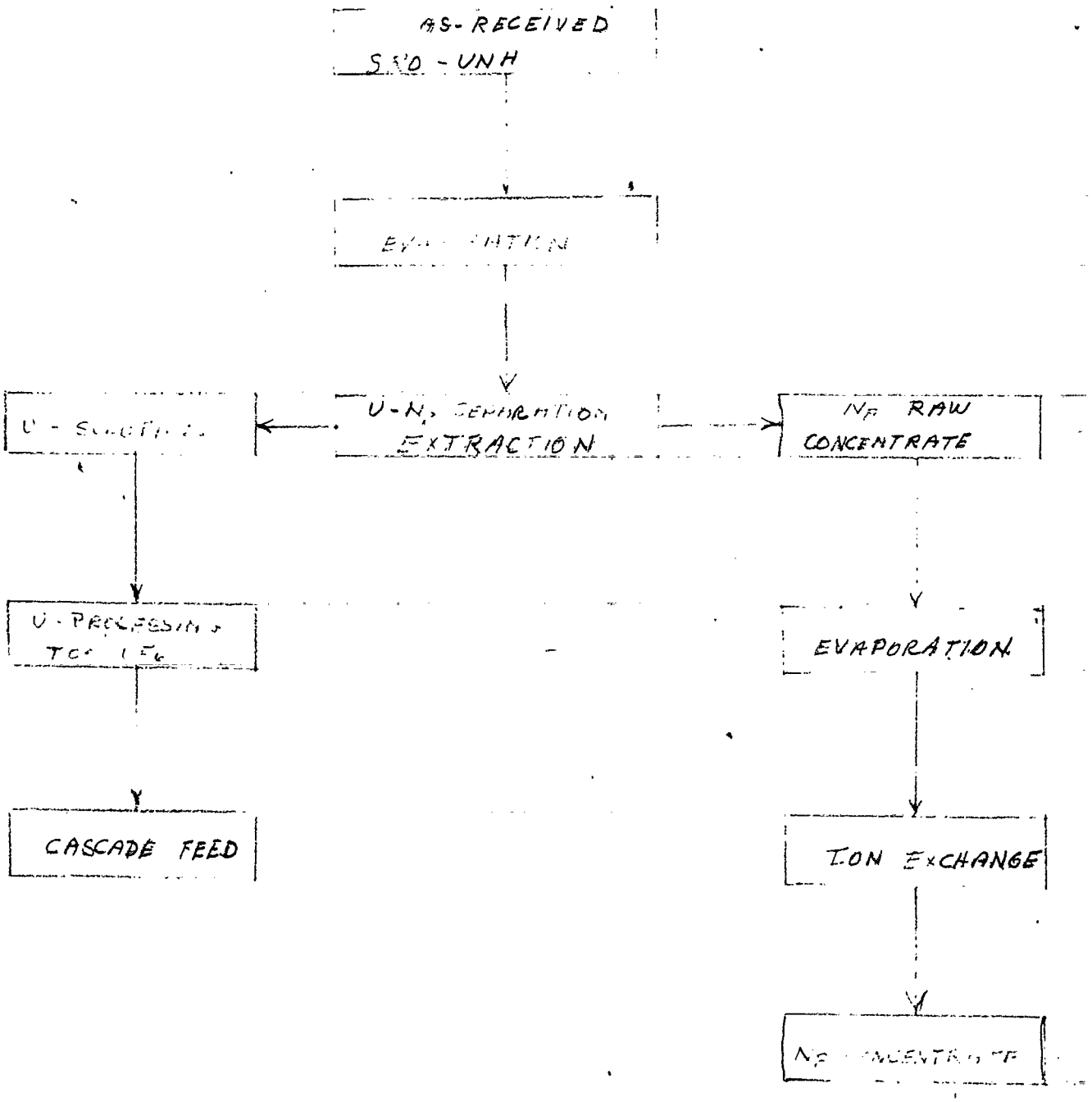
ORGDP METHOD OF Np RECOVERY FROM SRO - UNH



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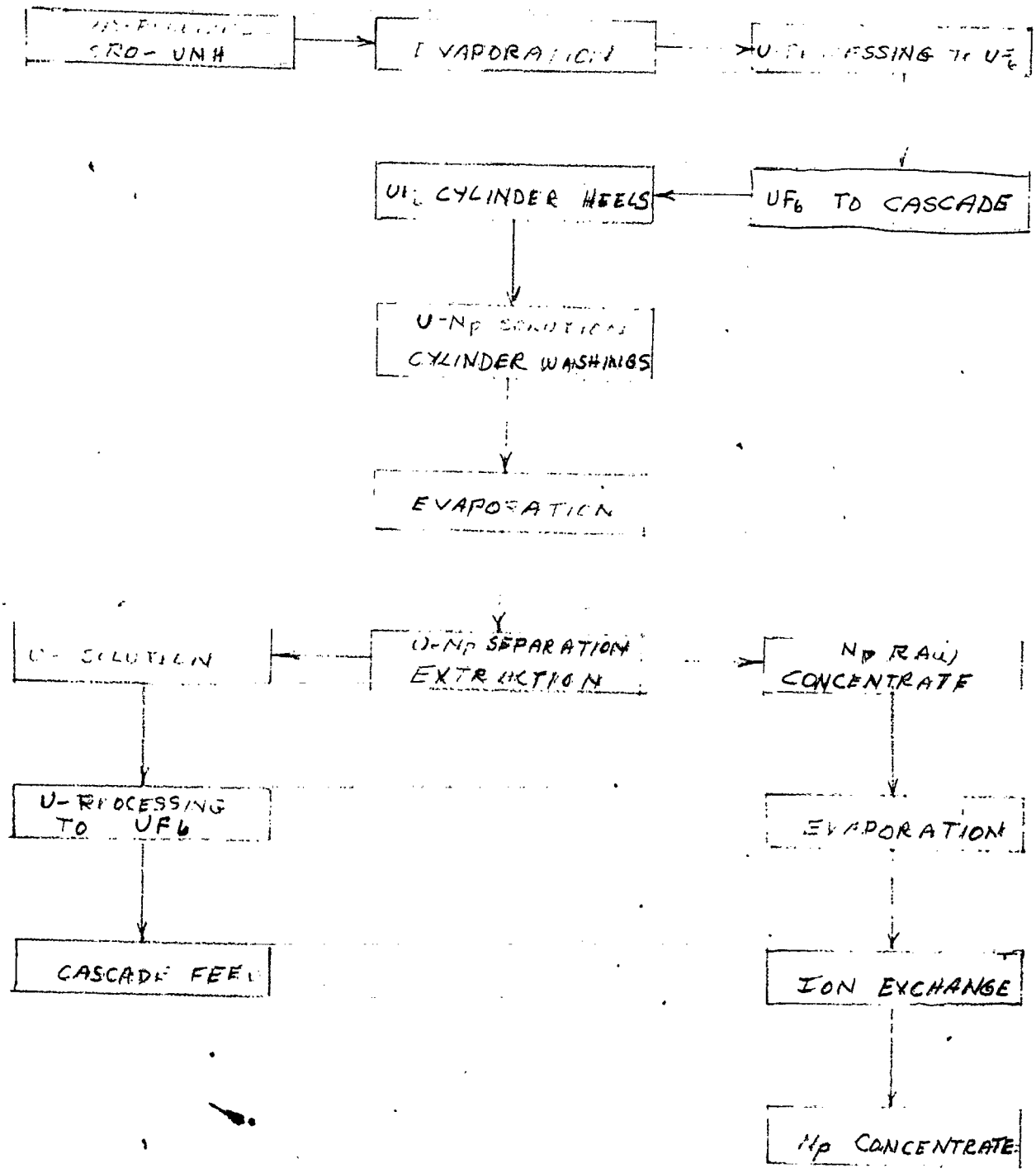
ALTERNATE ORGDP METHOD OF Np RECOVERY FROM SRO - UNH



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